DATA-SERVICE GMBH

From Mainframe to FreeBSD

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Outline

1. The DSS company
2. BS2000 features
3. Migration of peripheral components
4. The main migration project
5. Summary

The DSS company

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DSS – who we are

- located in Stockelsdorf (near Lübeck, Germany)
- Founded in 1977
- Now: 45 employees
- 20 programmers
- http://www.dssgmbh.de/

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Some of our customers

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DSS – what we are doing (I)

- develop customized programs for online and batch mode
- run a computing center, including network, data storage and backup
- provide an online system
- handle automated batch processing

DSS – what we are doing (II)

- data exchange with banks, publishers, post, etc.
- print letters, invoices, reminders, address labels for the mailing of magazines
- franking and enveloping of letters

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DSS – printing equipment

VarioPrint 5160
160 pages/min.

océ

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DSS – printing equipment

PageStream 7550
550 pages /min

océ

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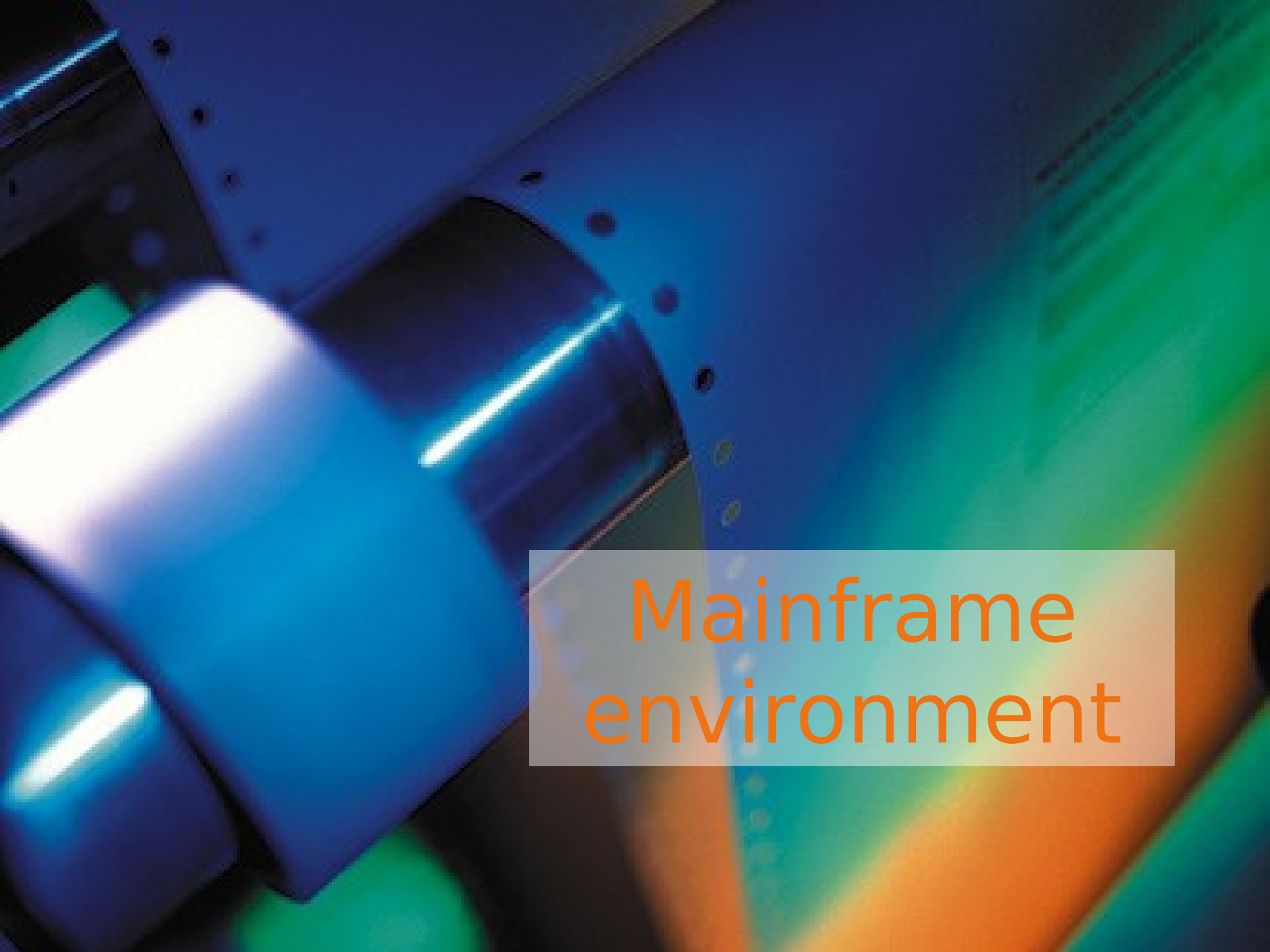
DSS – inserting systems

capacity:
20000 letters/h

currently 1.5
million letters
per month


Mainframe
environment

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BS2000 features

- stable and reliable
- easy administration and automation
- ISAM with shared updates, crash safe
- SORT, sorts binary data
- job queues
- sophisticated backup/restore (ARCHIVE)
- integrated SPOOL, printer protocol IPDS
- OpenFT: file transfer with job execution, automatic restart

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DSS applications

- master data stored in ISAM files
- application programs in COBOL (4600 programs, 2.5 million lines of code), but own data access interface written in “C”,
- own online transaction server in “C”, format handling with FHS, IFG

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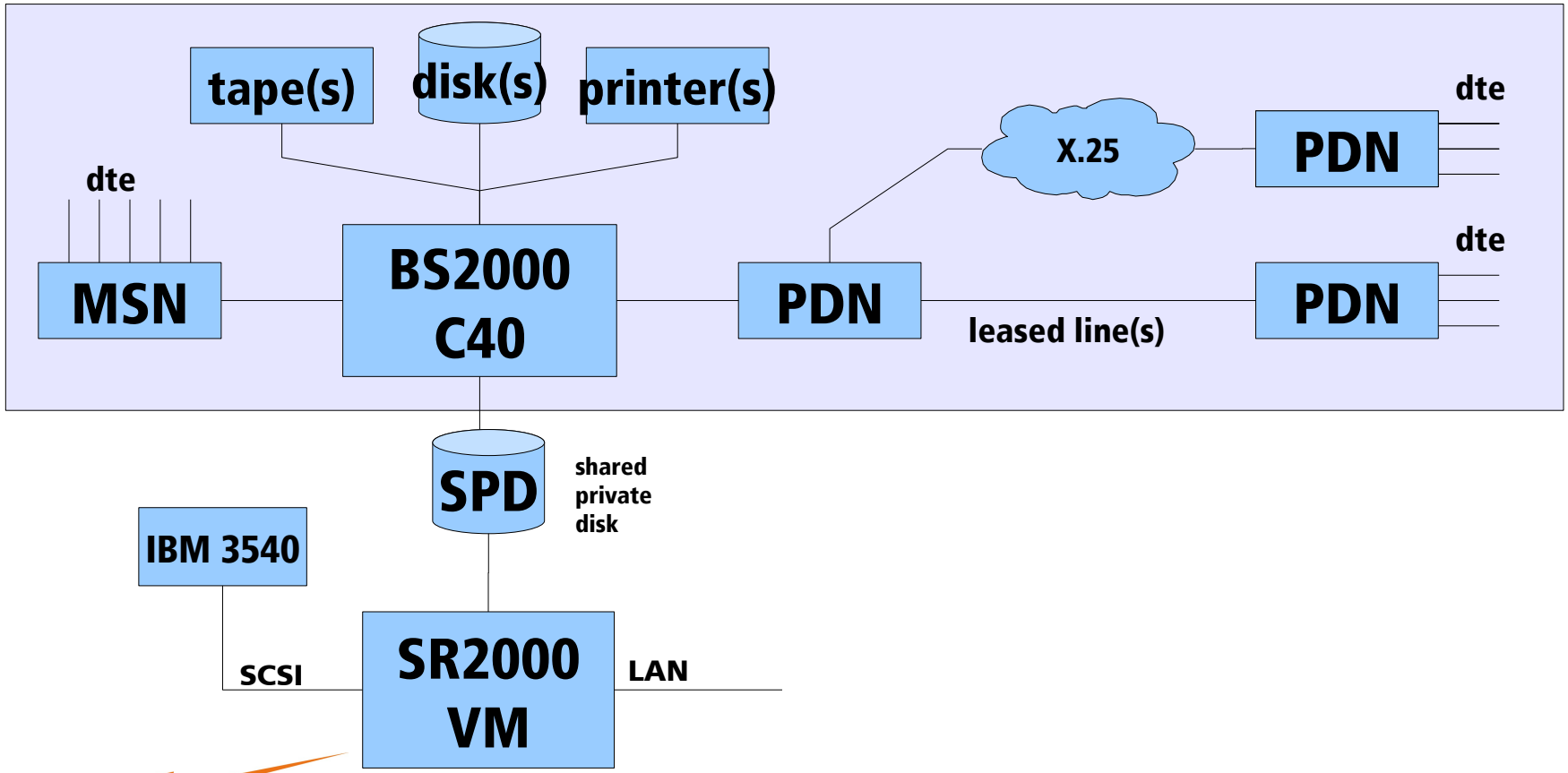
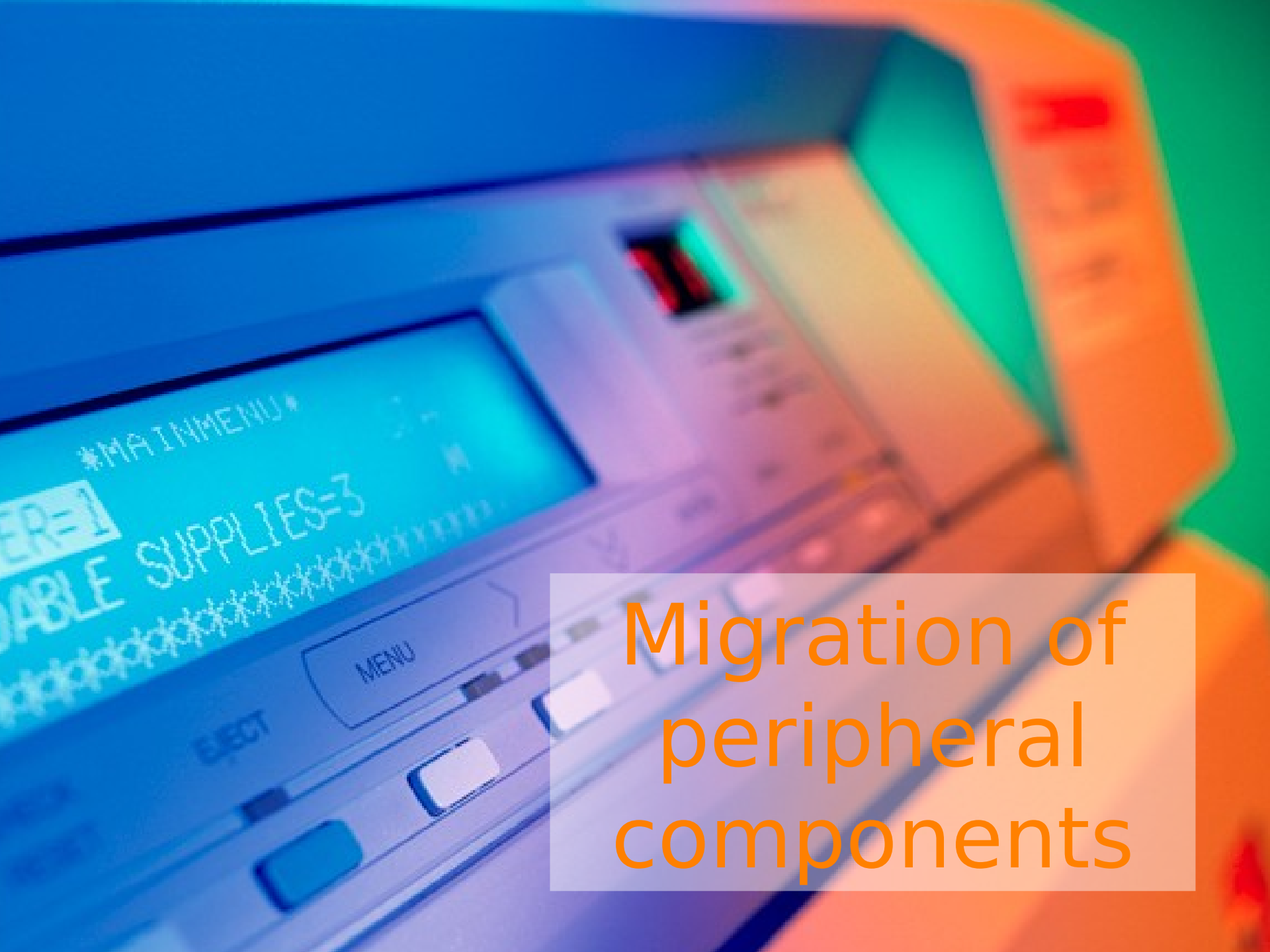
Phase I (1982-2000)





Migration of peripheral components

First migration steps (I)

- Online
  - Step 1: online client in “C”, that could show FHS formats, connection with TCP sockets via ISDN and Internet
  - Step 2: JAVA online client connecting to an online proxy, extendable to use graphical based screens

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First migration steps (II)

- Spool
  - Step 1: “PReS”, proprietary product with page description language, printer communication with IPDS over SCSI
  - Step 2: own page description program, output optional PS or PCL5, printer communication with PJL over TCP sockets, compiler “pres2c”

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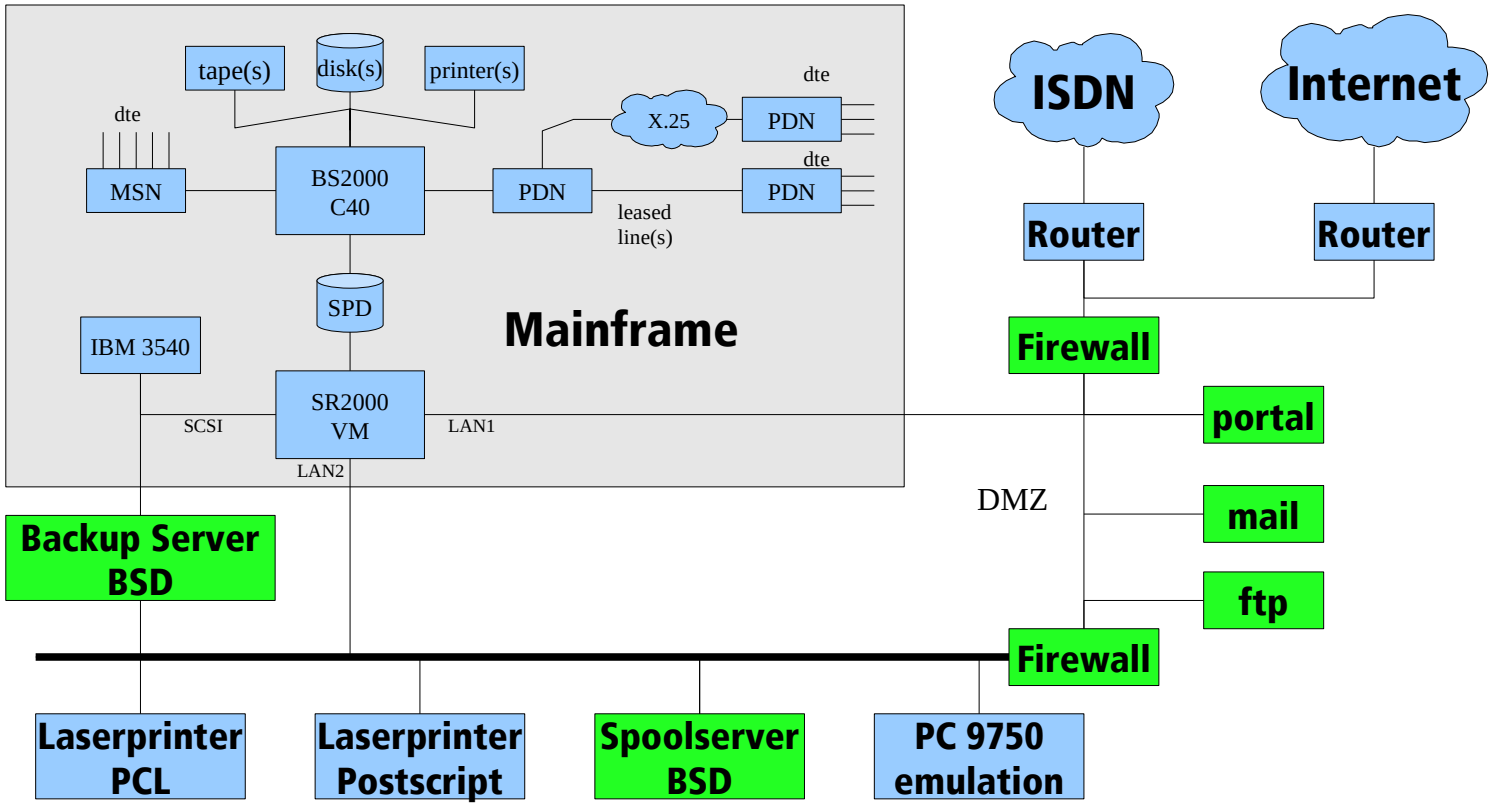
Phase II (2001-2004)




The main
migration
project

Main migration project (I)

- Drawbacks BS2000:
  - not easily scalable
  - Maintainance and upgrade expensive
  - Long support reaction time
- Pros FreeBSD:
  - stable
  - complete
  - consistent
  - BSD-licence
  - all sources available

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Main migration project (II)

- General plan:
  - Several servers, standard Intel based hardware
  - Operating system FreeBSD 4.6
  - Use only Open Source software
  - Keep all COBOL sources and consequently ISAM data storage and FHS online formats
  - Rewrite online server

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ISAM → Berkeley DB

- BDB Btree access system is “ISAM”
- rewrite of our file access module
- serialization with flock to avoid spinlocks
- replication: inserted TCP_NODELAY, implemented read_after write

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OpenCOBOL

- In 2005 version 0.30, properties missing
- Today nearly complete (85 and 2002 standard), see http://www.opencobol.org
- Added lacking points, removed bugs
- Automatic conversion of all sources, kept sources synchronous during the migration phase

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Other Replacements

- SORT → own tool “dss_sort”
- PERCON → perl scripts
- Job queues → SGE
- ARCHIVE → Amanda / Bacula
- PDN → Soekris (NanoBSD and pf)
- Procedures → shell scripts

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The actual platform change

- start a job exporting the data from BS2000 and importing them in FreeBSD, runs several hours
- change the destination server in the online proxy from mainframe to the FreeBSD server

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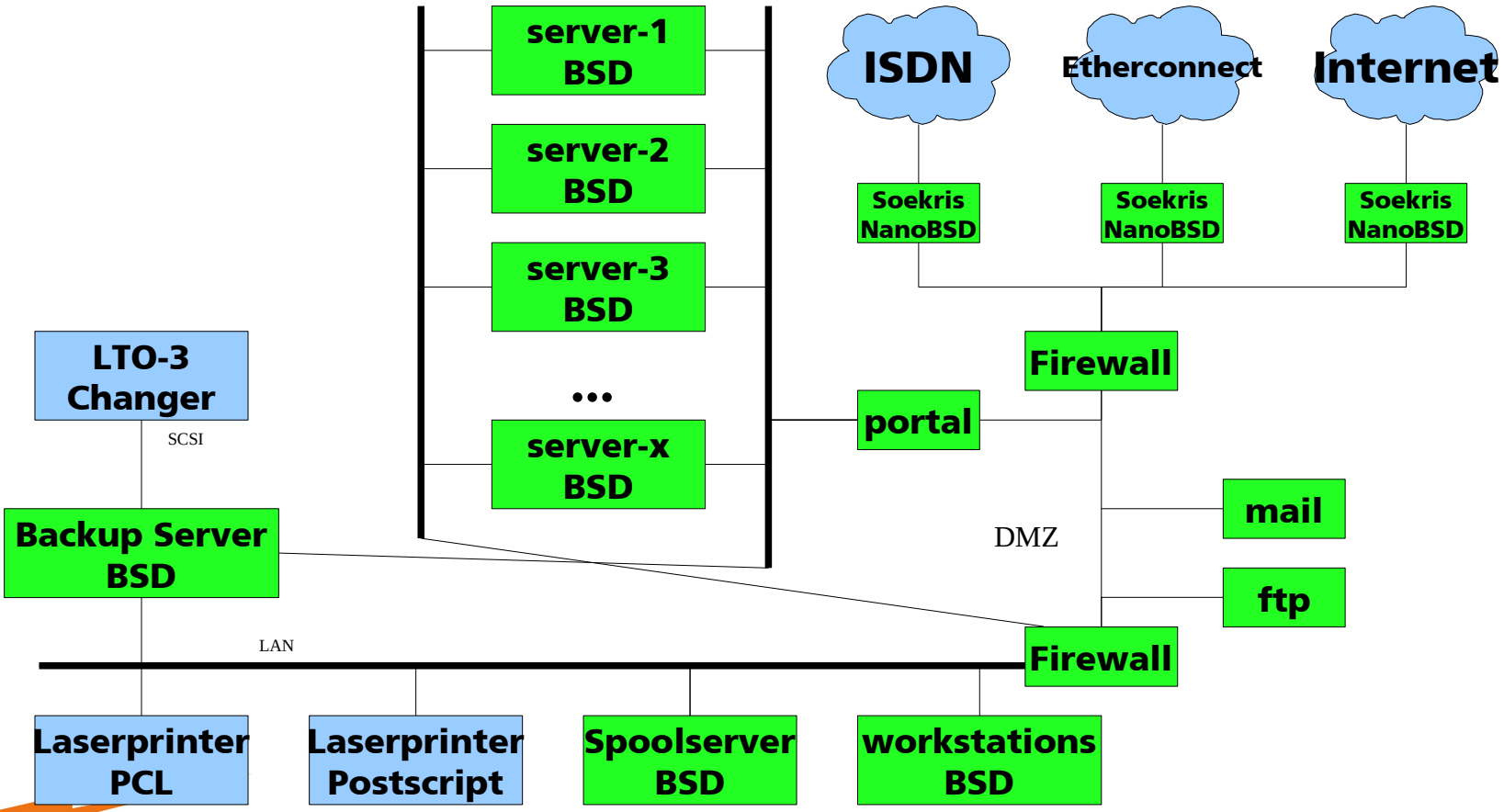
Phase III (2005-today)




Summary

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Migration Result

- Good performance
- Costs reduced
- Scalable system (jails, multiple servers)
- Easy testing and debugging
- Sources available
- Many features for future development

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Thank You for listening!

- Any questions?